

REMARKS

Claims 2 – 5, 8 – 10, 12, 15, and 19 are now pending in the application. Applicants thank the Examiner for the courtesies extended in the telephonic interview of June 30, 2004. In the telephonic interview, the claims and prior art references were discussed and detailed. Specifically, the claims were contrasted with the admitted prior art and Masaki reference (USPN 6,271,907). No agreement was reached, however. Notwithstanding, the Examiner is respectfully requested to reconsider and withdraw the rejection in view of the remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Claims 2 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPR (Applicants' admitted Prior Art shown at least in Figure 8 and specification pages 2 and 3, hereinafter AAPR) and further in view of Masaki et al. (U.S. Pat. No. 6,271,907, herein after Masaki). This rejection is respectfully traversed.

In rejecting the methods of claims 2 and 15 as being obvious under 35 U.S.C. § 103(a), the Examiner has relied upon the admitted prior art and Masaki. Neither the admitted prior art nor Masaki, however, teach removing a portion of an uncured injection port sealing material from an injection port. In contrast, the admitted prior art merely teaches in paragraph [0006] of the present application:

[0006] In order to solve the above problems as shown in Fig. 8, a end-sealing material 50 is applied to a rectangular panel 40 comprising substrates 46, 48 bonded to each other by a seal member 22, and after the end-sealing material 50 cures, a portion 50b of the end-sealing material 50 bleeding outside the contour of the panel is planed off by a planing member 60 such as a razor. However, in this method, a troublesome work of planing off the bleeding portion 50b of the cured end-sealing material is required, the working efficiency is degraded, a blade tip of the planing member 60 is brought into contact with end faces of the glass substrates 46, 48 in planing off the cured end-sealing material, microcracks can be formed thereby in the glass substrates 46, 48, and a problem occurs in that the

shock resistance of a liquid crystal panel 60 is degraded by the presence of the microcracks. This problem is serious in the liquid crystal panel using a thin and less rigid substrate as described above. (emphasis added)

As noted above in the excerpt from the specification, the admitted prior art explicitly teaches that the end sealing material is removed after the end-sealing material cures. To remove the end sealing material after the material has cured, the admitted prior art also teaches the use of a rigid instrument such as a razor blade. In this manner, any excess cured material that extends outward from the liquid crystal panel is “shaved” off. This method, however, causes microcracks to form in the glass substrates that sandwich the liquid crystal panel. These microcracks degrade the display quality of the panel, as well as increase the likelihood of the substrates being broken in the event of an excessive shock to the panel (i.e., when the panel is accidentally dropped).

In applying the Masaki reference in conjunction with the admitted prior art, the Examiner relies upon disclosure in Masaki that also teaches, in column 8, lines 25-30, curing a sealing agent 59(7) and then, in the vicinity of the liquid crystal injection port, cutting and scribing the blank cell by using a carbide wheel cutter. Analogous to the admitted prior art, however, the Masaki reference also teaches that the panel should be cut or scribed. A cutting or scribing step is not desirable because microcracks will also occur which will degrade the display quality and integrity of the liquid crystal panel. Since the Examiner has cited two references that teach shaving, cutting, or scribing, the Examiner has combined two prior art references that teach essentially the same thing. That is, the Examiner has combined two prior art references that each teach removing a cured sealing agent, which is exactly what the claimed invention intends to avoid. More specifically, the claimed invention intends to avoid shaving, cutting, or scribing the liquid crystal panel to avoid degrading the display quality and integrity.

To avoid degrading the display quality and integrity, the inventors of the claimed invention developed a method that includes an injection port sealing material applying step of applying an uncured injection port sealing material to a liquid crystal injection port after injecting the liquid crystal; an injection port sealing material removing step of removing at least a part of the injection port sealing material bleeding outside a contour of the liquid crystal panel, wherein the injection port sealing material removing step includes a step of absorbing the injection port sealing material by pressing an absorbent material against the injection port sealing material and absorbing the injection port sealing material with the absorbent material; and an injection port sealing material curing step of curing the injection port sealing material after the injection port sealing material removing step. In summary, the claimed invention calls for applying an uncured injection port sealing material to a liquid crystal injection port, removing a portion of the uncured injection port sealing material from the injection port with an absorbent material, and then curing the injection port sealing material after removing a portion of the injection port sealing material with the absorbent material.

Because an excess of the injection port sealing material is removed prior to curing, a damaging step of shaving, cutting, or scribing the liquid crystal panel is avoided to remove any excess material. Moreover, to further reduce the possibility of damaging the display panel in any way, the excess uncured injection port sealing material is removed with an absorbent material. By using the absorbent material, the liquid crystal panel is not exposed to a rigid tool to shave, cut, or scribe the liquid crystal panel. In contrast, the uncured material is simply absorbed. Again, it should be understood that this method reduces the possibility of damage to the liquid crystal panel to maintain a good display quality and integrity to the panel.

Since the Examiner has applied only prior art references that teach removing a cured end sealing material or sealing agent by shaving, cutting, or scribing, Applicants respectfully assert that the Examiner has not established a *prima facie* case of obviousness. “To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested.” *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Here, the claimed invention calls for curing the injection port sealing material after it has been removed. As neither the admitted prior art nor Masaki teach or suggest such a step, all of the claim limitations are not taught or suggested. As such, a *prima facie* case of obviousness has not been established. Applicants respectfully assert, therefore, that the claimed invention would not have been obvious in view of the admitted prior art as modified by Masaki.

Nevertheless, the Examiner alleges that it is well settled law that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. This allegation, however, neglects the fact that both the admitted prior art and Masaki, as stated above, fail to teach the removal of an injection port sealing material before it has been cured. Notwithstanding, Applicants respectfully assert that the claimed method does indeed provide unexpected results in that, by removing a portion of the end sealing material prior to curing the end sealing material, damage such as microcracks in the delicate glass substrates are averted because a razor or some other cutting or scribing device is not needed to “shave” the excess cured sealing material off of the substrates. Such a method also makes it easier to position other elements such as polarizers onto the substrates because there is no excess sealing material present, and the liquid crystal panel may be more easily positioned within a case body.

Furthermore, the claimed invention provides a solution to the above-described problems, such as microcracks for example, that are caused by the methods taught by the admitted prior art

and Masaki. Again, by teaching steps to remove the sealing agent after it has cured, the admitted prior art and Masaki are teaching exactly what the claimed invention is intending to avoid. As such, both the admitted prior art and Masaki effectively teach away from the claimed invention. By teaching away from the claimed method, a *prima facie* case of obvious in view of the admitted prior art and Masaki has not been established. The claimed invention, therefore, would not have been obvious in view of the admitted prior art as modified by Masaki.

Claims 3 – 5, 8 – 10, 12 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPR (Applicants' admitted Prior Art shown at least in Figure 8 and specification pages 2 and 3, hereinafter AAPR) and Masaki et al. (U.S. Patent No. 6,271,907, herein after Masaki) as applied to Claims 2 and 15 above, and further in view of Forlini et al. (U.S. Patent No. 3,744,126, herein after Forlini). This rejection is respectfully traversed.

As stated above, the admitted prior art and Masaki both teach away from the claimed invention. Furthermore, neither the admitted prior art nor Masaki teach or suggest all of the claim limitations. More specifically, both the admitted prior art and Masaki teach away from and fail to teach a step of curing an injection port sealing material after it has been removed. As such, it would not have been obvious to combine the teachings of the admitted prior art and Masaki with the teachings of Forlini to arrive at the claimed invention. That is, the alleged combination of the admitted prior art, Masaki, and Forlini still does not yield the claimed method, wherein an uncured injection port sealing material is removed prior to curing the injection port sealing material. Since this step is not found in any of the cited prior art references, the claimed invention of claims 3-5 , 8-10, 12 and 19, would not have been obvious.

Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Aug 19, 2004

HARNES, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

GGs/BEW/JAH

By: 

G. Gregory Schivley, Reg. No. 27,382
Bryant E. Wade, Reg. No. 40,344